Nieuwe herbicide 1, 3, 5 triazine derivaten

Koopman, Harmannus

SUMMARY

On behalf of a screening of their herbicidal properties we synthesised a number of 2 alkylamino 4,6 dichloro 1,3,5 triazines by a method described in the literature (Chapter II, A).

We also developed a convenient method for the synthesis of 2 alkyloxy- and 2 alkylthio 4,6 dichloro 1,3,5 triazines. These substances could be obtained in good yield by the reaction of an alcohol or a thiol with cyanuric chloride in the presence of 2,6,x collidine (Chapter II, B).

In 2 alkyloxy- and 2 alkylthio 4,6 dichloro 1,3,5 triazines one of the chlorine atoms could be specifically substituted by an alkylamino, alkyloxy or alkylthio group (Chapter II, C).

For research on U.V. absorption spectra we also synthesised a few 2 (p substituted phenyl) 4,6 dichloro 1,3,5 triazines (Chapter II, D).

The U.V. absorption spectra of these and of the above mentioned substances were compared with those of benzene derivatives. „Electron donating" groups on the p position of the phenyl nucleus of 2 phenyl 4,6 dichloro 1,3,5 triazine cause a strong bathochromic shift. „Electron attracting" groups have the opposite effect. The differences in the position of the absorptionmaxima and the relation between the absorption spectra of triazine- and benzene derivatives were discussed (Chapter III).

The stability of the 2 substituted 4,6 dichloro 1,3,5 triazines towards water was examined in a mixture of water and acetone. The 2 alkylamino 4,6 dichloro 1,3,5 triazines were more stable than the 2 alkyloxy and 2 alkylthio derivatives.

Compounds with an „electron donating" group on the p. position of the phenyl nucleus in 2 phenyl 4,6 dichloro 1,3,5 triazine were more stable towards hydrolysis than substances with an „electron attracting" group in the same position. These results could be associated with the unequal electron distribution between the carbon and the nitrogen atoms of the triazine nucleus (Chapter IV). In Chapter V the herbicidal properties of the 1,3,5 triazine derivatives are compared. Various tests were used. Many compounds exhibited strong phytotoxic activity on different plant species. This phytotoxicity was determined by spraying beans, tomatoes and oats with a one percent solution in a quantity corresponding with 10 kg per ha.

The 2 alkyloxy- and the 2 alkylthio 4,6 dichloro 1,3,5 triazines were slightly more active than the 2 alkylamino derivatives. The compounds with 3-6 carbon atoms in the side chain had the highest activity. The herbicidal activity was determined in small field trials.

The investigations showed that some of the new 1,3,5 triazine derivatives are promising as „pre emergence" herbicides.